



1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	04-Jan-13	05-Jan-13			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	8.000	8.000			
Log Start Depth (MD, ft)	762.00	5,542.00			
Log End Depth (MD, ft)	5,542.00	6,678.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	03-Jan-13 14:45	04-Jan-13 16:00			
Drill/Wipe End Date and Time	04-Jan-13 07:30	05-Jan-13 07:45			
Min Inc (deg) @ Depth (MD, ft)	.18 @ 5,181.00	.92 @ 5,552.00			
Max Inc (deg) @ Depth (MD, ft)	14.98 @ 2,616.00	80.18 @ 6,621.00			
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC			
Flow Rate (gpm)	595.00	595.00			
Max AV (fpm) / CV (fpm) @ MWD	477.1 / 477.1	477.1 / 477.1			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.45 / 28.00	9.50 / 37.00			
Filtrate CL (ppm)	650.00	650.00			
pH / Fluid Loss (mptm)	11.50 / N/A	9.50 / N/A			
PV (cP) / YP (lbf2)	1 / 3.00	8 / 7.00			
% Solids / % Sand	1 / 0.05	4.7 / 0.25			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (deg F) / S	144.78 / PGM	122.22 / PGM			

Max Tool Temp (degF) / Source	141.70 / PCM	160.83 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Robert Ley	Robert Ley			
Customer Representative	Jeremy Stolz	Jeremy Stolz			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11341341	11341341			
Insert Serial Number	11680785	11680785			
Date and Time Initialized	02-Jan-13 15:12	01-Jan-70 00:00			
Date and Time Read	05-Jan-13 14:06	05-Jan-13 14:00			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	57.00	57.00			
Software Version	6.21	6.21			
Sub Serial Number	11341341	11341341			
Sonde Serial Number	11833258	11833258			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	160.00	277.34			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	50.19	49.75			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341341	11341341			
Insert/Sonde Serial Number	11293270	11293270			

REMARKS

1. All depths are true vertical depths and are calibrated to the driller' pipe tally and are measured from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. The Following smoothing parameters have been applied to the data"

PGRC (Gamma Ray Corrected):
Interval Resolution: 0.5 feet
Coercion Distance: 0.6 feet
Gap Fill: 3.0 feet

ROPA (Rate of Penetration):
Interval Resolution: 0.5 feet
Coercion Distance: 1.2 feet

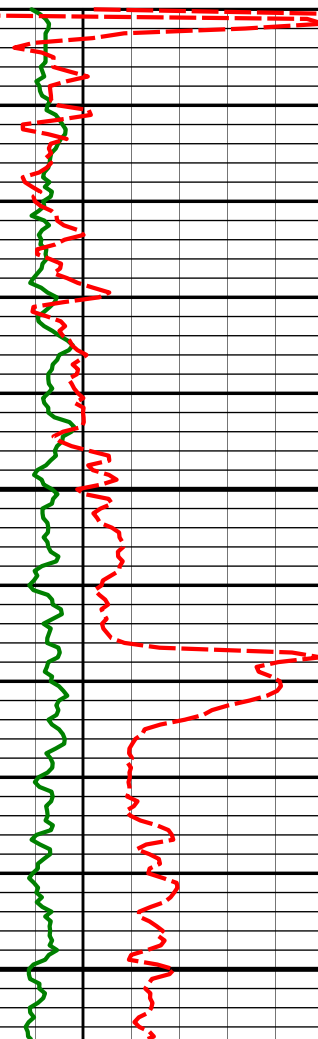
WARRANTY

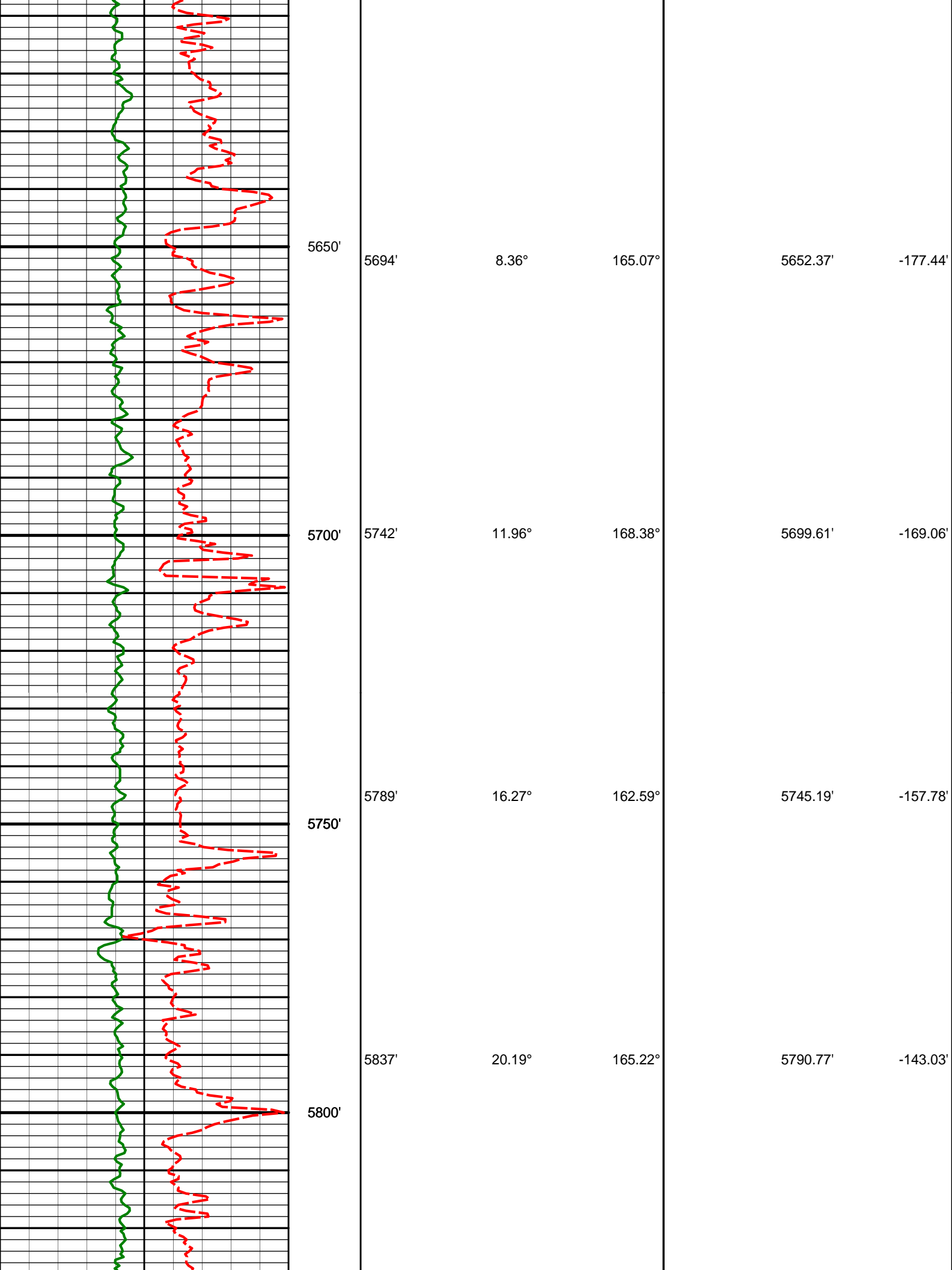
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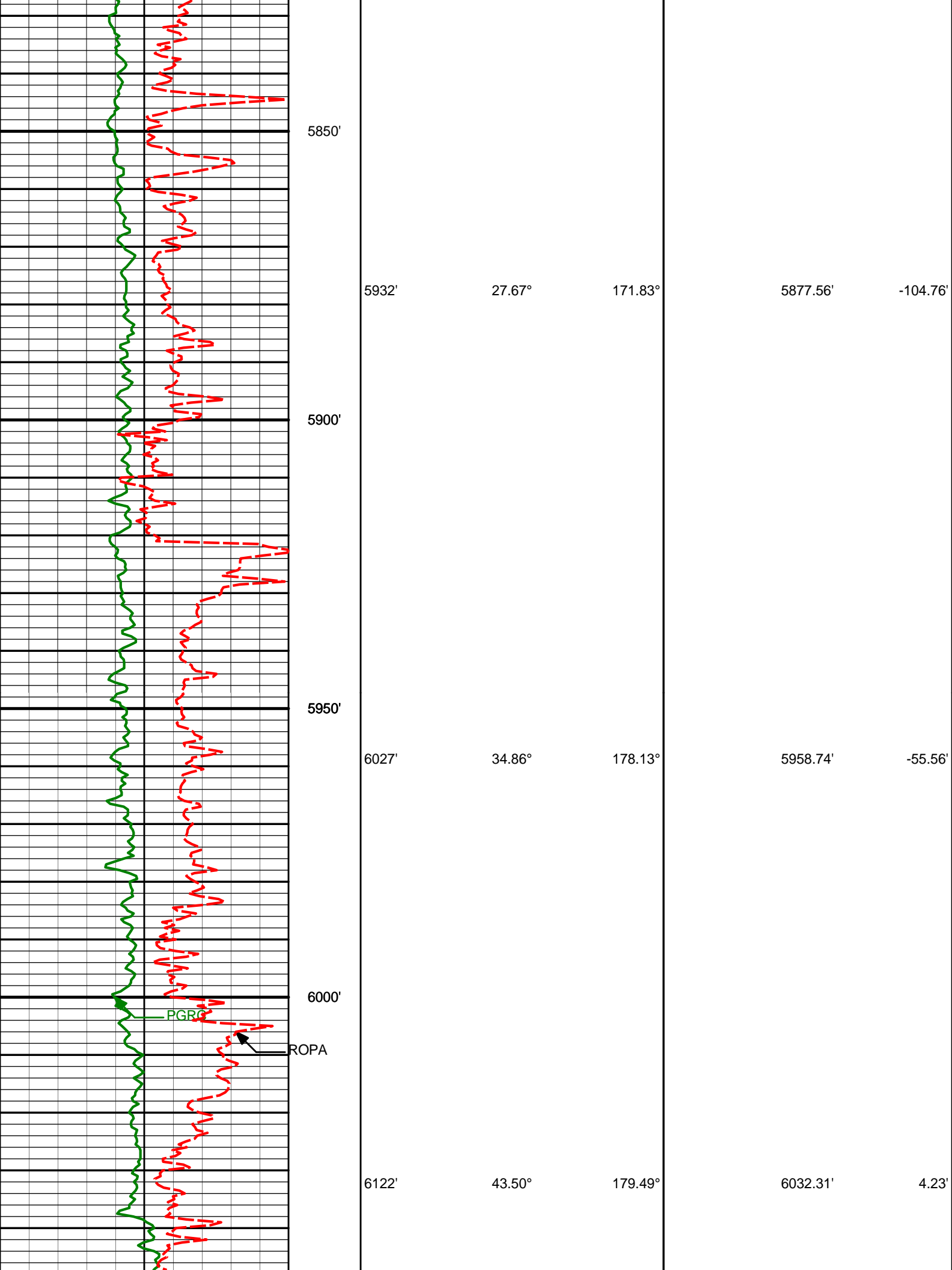
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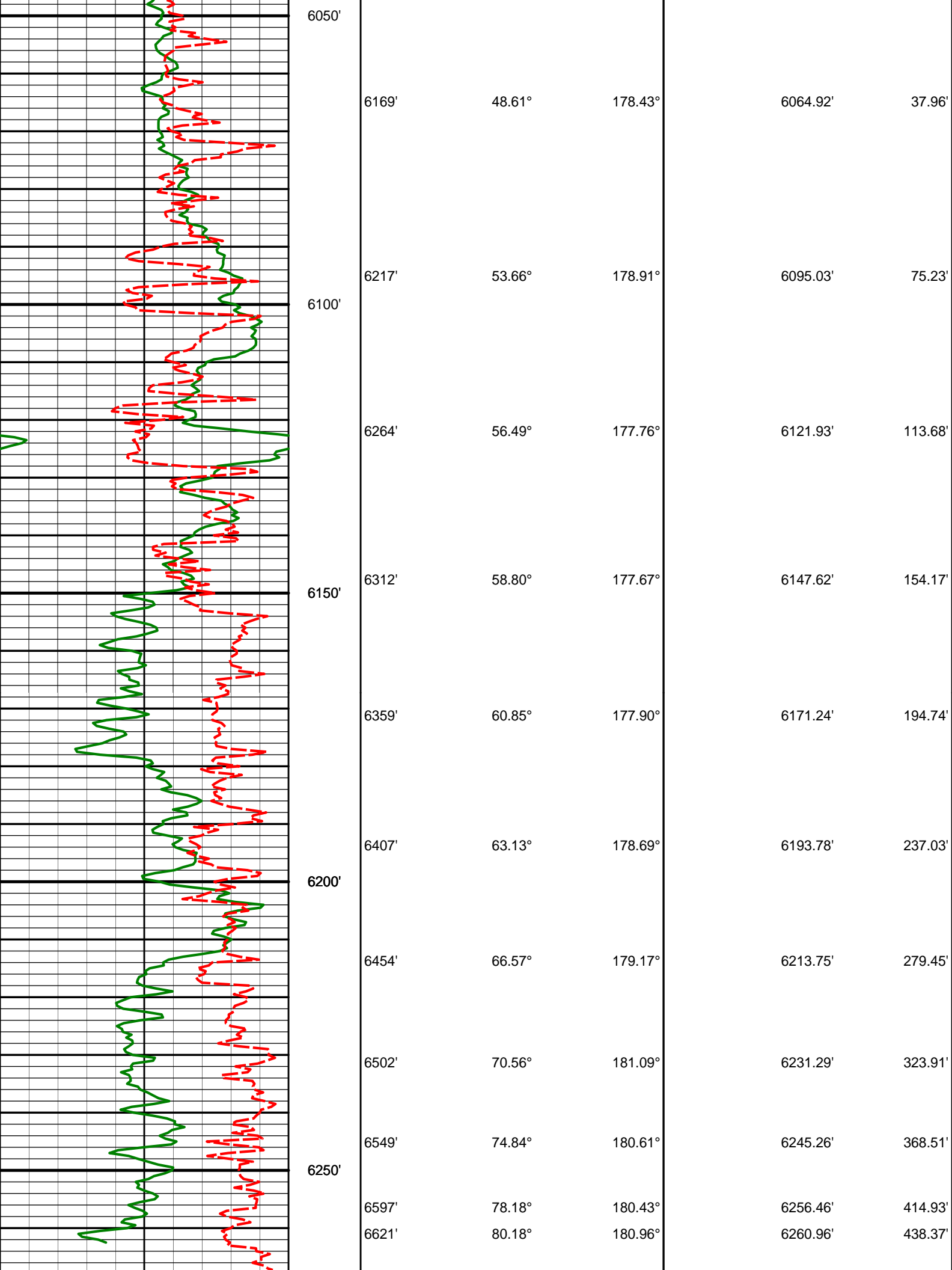
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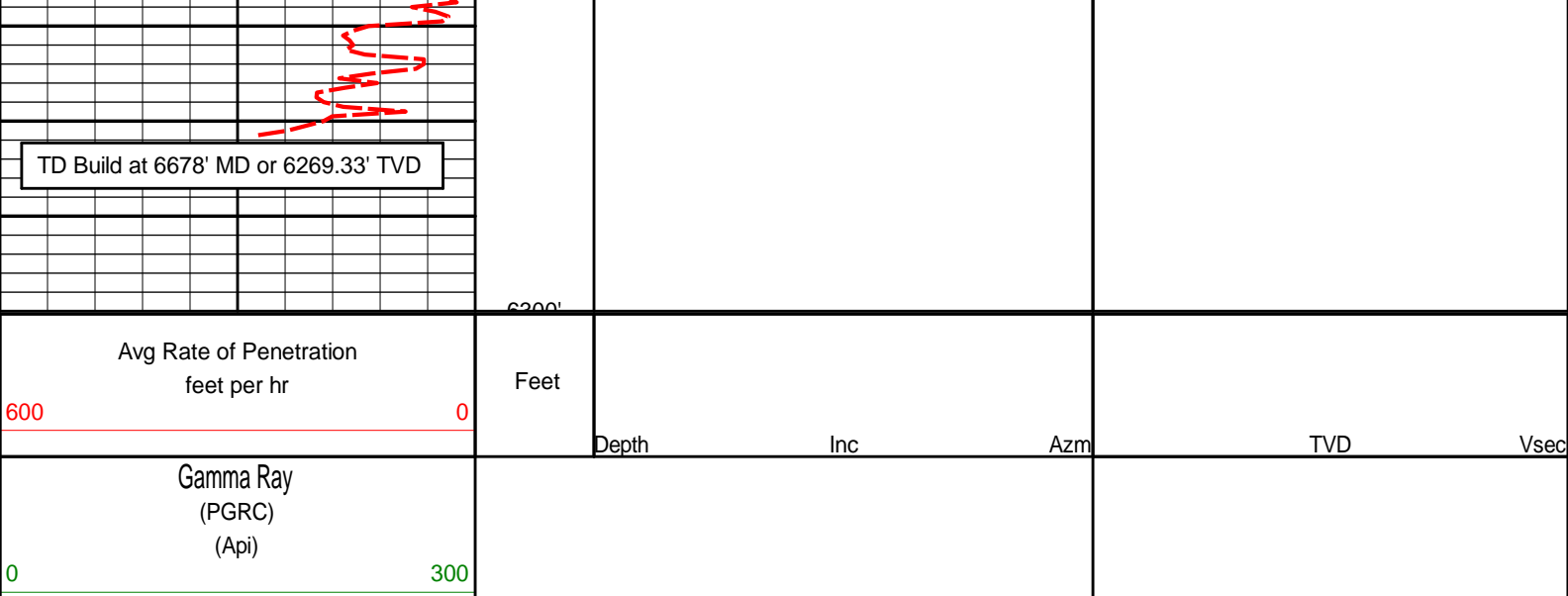
TVD Detail Log 1:240

Gamma Ray (PGRC) (Api)						
0300						
Avg Rate of Penetration feet per hr		Feet				
6000						
		Run 200	Depth	Inc	Azm	TVDVsec
		5550'	5552'	0.92°	22.82°	5510.82'-186.48'









HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Ptasnik Federal LC19-74HN
Wattenberg
Weld Colorado
USA
CA-XX-0900067303

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
762.00	0.00	0.00	762.00	0.00 N	0.00 E	0.00	TIE-IN
825.00	1.27	198.29	824.99	0.66 S	0.22 W	0.64	2.02
1104.00	1.23	172.88	1103.93	6.57 S	0.82 W	6.46	0.20
1383.00	0.93	143.00	1382.88	11.33 S	0.91 E	11.37	0.22
1666.00	0.65	136.70	1665.86	14.33 S	3.39 E	14.58	0.10
1951.00	0.73	140.80	1950.84	16.91 S	5.64 E	17.37	0.03
2046.00	2.07	91.59	2045.81	17.43 S	7.74 E	18.08	1.77
2141.00	3.50	65.08	2140.70	16.26 S	12.09 E	17.32	1.98
2236.00	6.78	63.93	2235.30	12.57 S	19.75 E	14.36	3.45
2331.00	8.78	61.11	2329.42	6.61 S	31.13 E	9.49	2.15
2426.00	11.56	60.45	2422.92	1.60 N	45.77 E	2.69	2.93
2521.00	12.94	60.78	2515.75	11.49 N	63.34 E	-5.52	1.46
2616.00	14.98	58.16	2607.94	23.16 N	83.06 E	-15.30	2.24
2806.00	14.28	55.16	2791.79	49.50 N	123.15 E	-37.77	0.54
3091.00	14.43	51.59	3067.89	91.64 N	179.83 E	-74.44	0.31
3281.00	12.46	55.41	3252.68	117.98 N	215.26 E	-97.36	1.14
3471.00	8.63	50.82	3439.44	138.63 N	243.19 E	-115.31	2.06
3661.00	10.23	54.16	3626.87	157.52 N	267.92 E	-131.80	0.89
3850.00	11.60	52.61	3812.45	178.88 N	296.62 E	-150.39	0.74
3946.00	9.90	57.08	3906.76	189.23 N	311.22 E	-159.33	1.97
4041.00	6.63	44.61	4000.77	197.57 N	321.94 E	-166.64	3.91
4135.00	4.41	42.89	4094.32	204.08 N	328.21 E	-172.53	2.37
4230.00	3.24	42.09	4189.11	208.75 N	332.49 E	-176.78	1.24
4325.00	0.90	43.69	4284.04	211.28 N	334.80 E	-179.08	2.46
4515.00	1.17	104.32	4474.02	211.87 N	337.71 E	-179.40	0.56
4706.00	1.97	40.78	4664.96	213.87 N	341.75 E	-181.01	0.94
4896.00	1.02	41.00	4854.89	217.62 N	344.99 E	-184.44	0.50
4991.00	1.76	242.37	4949.88	217.58 N	344.25 E	-184.47	2.88
5181.00	0.18	255.06	5139.84	216.15 N	341.36 E	-183.31	0.83
5371.00	1.09	37.19	5329.83	217.51 N	342.16 E	-184.60	0.66
5485.00	0.42	18.57	5443.82	218.77 N	342.95 E	-185.78	0.62
5552.00	0.92	22.82	5510.82	219.50 N	343.24 E	-186.48	0.76
5647.00	5.14	169.14	5605.71	216.02 N	344.34 E	-182.91	6.25
5694.00	8.36	165.07	5652.37	210.65 N	345.62 E	-177.44	6.91
5742.00	11.96	168.38	5699.61	202.41 N	347.52 E	-169.06	7.59

5789.00	16.27	162.59	5745.19	191.35 N	350.47 E	-157.78	9.64
5837.00	20.19	165.22	5790.77	176.92 N	354.60 E	-143.03	8.34
5932.00	27.67	171.83	5877.56	139.18 N	361.93 E	-104.76	8.36
6027.00	34.86	178.13	5958.74	90.14 N	365.95 E	-55.56	8.30
6122.00	43.50	179.49	6032.31	30.20 N	367.13 E	4.23	9.14
6169.00	48.61	178.43	6064.92	3.63 S	367.75 E	37.96	10.99
6217.00	53.66	178.91	6095.03	40.98 S	368.61 E	75.23	10.56
6264.00	56.49	177.76	6121.93	79.49 S	369.74 E	113.68	6.34
6312.00	58.80	177.67	6147.62	120.01 S	371.36 E	154.17	4.82
6359.00	60.85	177.90	6171.24	160.60 S	372.93 E	194.74	4.37
6407.00	63.13	178.69	6193.78	202.96 S	374.19 E	237.03	4.98

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 174.64 DEGREES (GRID)
A TOTAL CORRECTION OF 7.38 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6407.00 FEET
IS 425.69 FEET ALONG 118.48 DEGREES (GRID)**